

**Notice of Allowability**

Application No.

08/943,144

Examiner

Russell Kallis

Applicant(s)

KOSHIBA, TOMOKAZU

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 9/29/2003.
  2. ☒ The allowed claim(s) is/are 20-29, 31-33 (renumbered claims 1-13).
  3. ☐ The drawings filed on \_\_\_\_\_ are accepted by the Examiner.
  4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) ☒ All b) ☐ Some\* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
    - (a) ☐ The translation of the foreign language provisional application has been received.
  6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No. \_\_\_\_\_.
  - (b) ☐ including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the Examiner.
  - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |  |
|--|--|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                     |
| 2 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 6 <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No. <u>11/15/2003</u> |
| 3 <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. <u>12/01/2003</u> | 7 <input checked="" type="checkbox"/> Examiner's Amendment/Comment                             |
| 4 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material                       | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance            |
|  | 9 <input type="checkbox"/> Other   |

### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In the Claims:

Claim 30 has been cancelled.

Claim 20 (twice amended). An isolated polynucleotide encoding an aldehyde oxidase enzyme, wherein said enzyme oxidizes an aldehyde compound to a carboxylic acid, and wherein said polynucleotide has a sequence selected from the group consisting of:

(a) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 2;

(b) [a] the nucleotide sequence [shown by] of SEQ ID NO: 1;

(c) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 4;

(d) [a] the nucleotide sequence [shown by] of SEQ ID NO: 3 and

(e) a maize nucleotide sequence [encoding an amino acid sequence] of about [a] 4.4 Kbp [gene obtainable from maize plant (*Zea mays* L), wherein said gene of about 4.4 Kbp is amplifiable with a combination of a PCR primer selected from the group consisting of SEQ ID NO: 7, SEQ ID NO: 8, and SEQ ID NO: 13 and a PCR primer selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 14, and SEQ

ID NO: 15].

Claim 22 (twice amended). A plasmid comprising a polynucleotide encoding an aldehyde oxidase enzyme, wherein said enzyme oxidizes an aldehyde compound to a carboxylic acid, and wherein said polynucleotide has a sequence selected from the group consisting of:

(a) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 2;

(b) [a] the nucleotide sequence [shown by] of SEQ ID NO: 1;

(c) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 4;

(d) [a] the nucleotide sequence [shown by] of SEQ ID NO: 3 and

(e) a maize nucleotide sequence [encoding an amino acid sequence] of about [a] 4.4 Kbp [gene obtainable from maize plant (*Zea mays* L), wherein said gene of about 4.4 Kbp is amplifiable with a combination of a PCR primer selected from the group consisting of SEQ ID NO: 7, SEQ ID NO: 8, and SEQ ID NO: 13 and a PCR primer selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 14, and SEQ ID NO: 15].

Claim 23 (once amended). A transformed host cell [transformed by introducing] comprising the plasmid according to claim 22 [into a host cell].

Claim 26 (twice amended). A process of constructing an expression plasmid which comprises ligating in a functional manner

(1) a promoter capable of functioning in a plant cell upstream from,

(2) a polynucleotide encoding an aldehyde oxidase enzyme, wherein said enzyme oxidizes an aldehyde compound to a carboxylic acid, and wherein said polynucleotide has a sequence selected from the group consisting of:

(a) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 2;

(b) [a] the nucleotide sequence [shown by] of SEQ ID NO: 1;

(c) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 4;

(d) [a] the nucleotide sequence [shown by] of SEQ ID NO: 3 and

(e) a maize nucleotide sequence [encoding an amino acid sequence] of about [a] 4.4 Kbp [gene obtainable from maize plant (*Zea mays* L), wherein said gene of about 4.4 Kbp is amplifiable with a combination of a PCR primer selected from the group consisting of SEQ ID NO: 7, SEQ ID NO: 8, and SEQ ID NO: 13 and a PCR primer selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 14, and SEQ ID NO: 15.], and

(3) a terminator functional in a plant downstream from the polynucleotide of (2).

Claim 27 (twice amended). An expression plasmid comprising:

(1) a promoter capable of functioning in a plant cell,

(2) a polynucleotide encoding an aldehyde oxidase enzyme, wherein said enzyme oxidizes an aldehyde compound to a carboxylic acid, and wherein said polynucleotide has a sequence selected from the group consisting of:

- (a) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 2;
  - (b) [a] the nucleotide sequence [shown by] of SEQ ID NO: 1;
  - (c) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 4;
  - (d) [a] the nucleotide sequence [shown by] of SEQ ID NO: 3 and
  - (e) a maize nucleotide sequence [encoding an amino acid sequence] of about [a] 4.4 Kbp [gene obtainable from maize plant (*Zea mays* L), wherein said gene of about 4.4 Kbp is amplifiable with a combination of a PCR primer selected from the group consisting of SEQ ID NO: 7, SEQ ID NO: 8, and SEQ ID NO: 13 and a PCR primer selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 14, and SEQ ID NO: 15.], and
- (3) a terminator capable of functioning in a plant which are ligated in a functional manner and in the order described above.

Claim 28 (twice amended). A process [for controlling production of an] for producing aldehyde oxidase in a transformed host cell which comprises introducing into a host cell an expression plasmid comprising:

- (1) a promoter functional in a plant cell upstream from,
- (2) a polynucleotide encoding an aldehyde oxidase enzyme wherein said enzyme oxidizes an aldehyde compound to a carboxylic acid, and wherein said polynucleotide has a sequence selected from the group consisting of:

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(a) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 2;

(b) [a] the nucleotide sequence [shown by] of SEQ ID NO: 1;

(c) a nucleotide sequence encoding [an] the amino acid sequence [shown by] of SEQ ID NO: 4;

(d) [a] the nucleotide sequence [shown by] of SEQ ID NO: 3 and

(e) a maize nucleotide sequence [encoding an amino acid sequence] of about [a] 4.4 Kbp [gene obtainable from maize plant (*Zea mays* L), wherein said gene of about 4.4 Kbp is amplifiable with a combination of a PCR primer selected from the group consisting of SEQ ID NO: 7, SEQ ID NO: 8, and SEQ ID NO: 13 and a PCR primer selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 14, and SEQ ID NO: 15.], and

(3) a terminator functional in a plant and downstream from the polynucleotide of (2), which are ligated in a functional manner to transform said host cell whereby the production of aldehyde oxidase of the transformed host cell is controlled.

Claim 31 (once amended). An isolated polynucleotide encoding an aldehyde oxidase enzyme[, wherein said polynucleotide has a nucleotide sequence encoding an] comprising the amino acid sequence [shown by] of SEQ ID NO: 2.

Claim 32 (once amended). An isolated polynucleotide encoding an aldehyde oxidase enzyme[, wherein said polynucleotide has a nucleotide sequence encoding an] comprising the amino acid sequence [shown by] of SEQ ID NO: 4.

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Claim 33 (once amended). Am isolated polynucleotide encoding an aldehyde oxidase enzyme, wherein said polynucleotide has [a] the nucleotide sequence [shown by] of SEQ ID NO: 1 or [3] SEQ ID NO: 3.

The following is an examiner's statement of reasons for allowance: Amplification language was deleted from Claims 20, 22, 26, 27, and 28 because reaction conditions were not specified and hence it did not further limit the claim. Applicant's description of two maize aldehyde oxidase genes supports the claim to any maize nucleic acid encoding an aldehyde oxidase because genomic Southern hybridization results using maize aldehyde oxidase probes in Applicant's post filing publication (Sekimoto H. *et al.*, Journal of Biological Chemistry, 1997; Vol. 272, No: 24, pages 15280-15285) indicates that the genes encoding maize aldehyde oxidase comprise a small gene family.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell Kallis whose telephone number is (703) 305-5417. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on (703) 306-3218. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0198.

Russell Kallis Ph.D.  
November 10, 2003

A handwritten signature in black ink, appearing to read "Amy Nelson". The signature is fluid and cursive, with the first name "Amy" and last name "Nelson" clearly distinguishable.

**AMY J. NELSON, PH.D**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1600**